

AUSTRALIAN NEMESTRINIDAE. (DIPTERA).

By G. H. HARDY.

(Thirteen text-figures.)

[Read 29th October, 1924.]

The key to the species of the genus *Trichophthalma* given below, was found amongst the manuscript papers of the late Arthur White,* now in the possession of Dr. E. W. Ferguson. The information derived from this source has afforded considerable assistance in identifying species of the family, as the identity of some may not have been readily discovered from the descriptions alone. In White's original manuscript the order of the various lines is not in accordance with the more simplified form given here, but the wording is the same.

White's key to the species of the genus Trichophthalma, based upon types and other specimens in the British Museum Collection.

- | | |
|--|-------------------------------|
| 1. Abdomen spotted | 2 |
| Abdomen with two longitudinal stripes | 3 |
| Abdomen with one longitudinal stripe | 4 |
| Abdomen with cross bands | 5 |
| Abdomen with both dorsal lines and cross bands | 6 |
| Abdomen without either bands or stripes | 7 |
| 2. Abdomen with from two to six white spots; little species | <i>albimacula</i> Walk. |
| Abdomen with a row of dark central spots | <i>novae-hollandiae</i> Macq. |
| 3. Abdomen brown, thorax and abdomen each with two yellow stripes; rather small species | <i>leucophaea</i> Walk. |
| 4. Abdomen pale yellow or grey with a broad black central stripe and black side margins | <i>bivitta</i> Walk. |
| Abdomen yellow with a very broad black stripe; thorax black, fringed with yellow hairs; a very small slender species | <i>bivittata</i> Westw. |
| Abdomen bright orange with black dorsal stripe; thorax with a median stripe | <i>fulva</i> Walk. |
| Abdomen red-brown, with an indistinct black dorsal stripe; wings with the costal half brownish | <i>costalis</i> Westw. |
| 5. Abdomen covered with pale grey pubescence, crossed by two narrow black bands; wings hyaline | <i>primitiva</i> Walk. |
| Abdomen black, with two narrow yellow bands; thorax with two distinct yellow stripes | <i>laetilinea</i> Walk. |

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- Resembles *laetilinea*, but much smaller, markings distinct and wings much paler; in one specimen the abdominal bands are replaced by yellow spots *richardoae* Licht.
6. Wings remarkably short. Abdomen yellow with four black cross-bands and black dorsal stripe *variolora* Licht.
7. Uniformly red-brown; wings hyaline with costa suffused red-brown *funesta* Walk.
- Uniform dark black; thorax with pale yellow hairs on sides; wings hyaline with base dark brown; large species *nigripes* Macq.
- Uniform dull black; sides of thorax, scutellum and apex of abdomen with fulvous hairs; large species (unknown to me) *scapularis* Big.
- Entirely dull brownish; wings hyaline with costa narrowly brown; median-sized species *obscura* Westw.
- Small dark species with wings suffused dark brown (the identification of this species is queried in the B. M. collection) *fuscipennis* Thoms.

The types of the following species are not to be found in the British Museum Collection: *albitarsis*, *aurora* and *degener* Walker.

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Family NEMESTRINIDAE.

The characters that most readily distinguish this family are to be found in the venation, a detailed account of which is given under each genus, where it will be noted the one outstanding feature in common to all genera, and unique to the family, consists of a secondary diagonal vein composed of portions of various veins. The anal vein is free. The epodium is pulvilliform.

Key to the genera of Australian Nemestrinidae.

1. Proboscis well developed, long. Cubital vein forked and independent of the radial vein *Trichophthalma*
 Proboscis small or vestigial. If the cubital vein is forked, then joined directly to, or by a cross-vein with the radial 2
2. Cubital vein forked; the upper branch may be obsolete, but if so this can be recognised by the presence of the cross-vein between the cubital and radial veins 3
 Cubital vein never forked or joined by a cross-vein with the radial 4
3. Upper branch of the cubital vein complete and joined at nearly half its length with the radial vein by a cross-vein *Exeretoneura*
 Upper branch of the cubital vein vestigial and joined by a cross-vein with the radial at its base *Trichopsidea*
4. Cubital vein united with the first postical, and also the fourth and fifth posticals united before reaching the wing margin *Nycterimorpha*
 Cubital and fourth postical veins free, or at most the latter meets the third postical at the wing margin *Atriatops*

- Resembles *laetilinea*, but much smaller, markings distinct and wings much paler; in one specimen the abdominal bands are replaced by yellow spots *richardoae* Licht.
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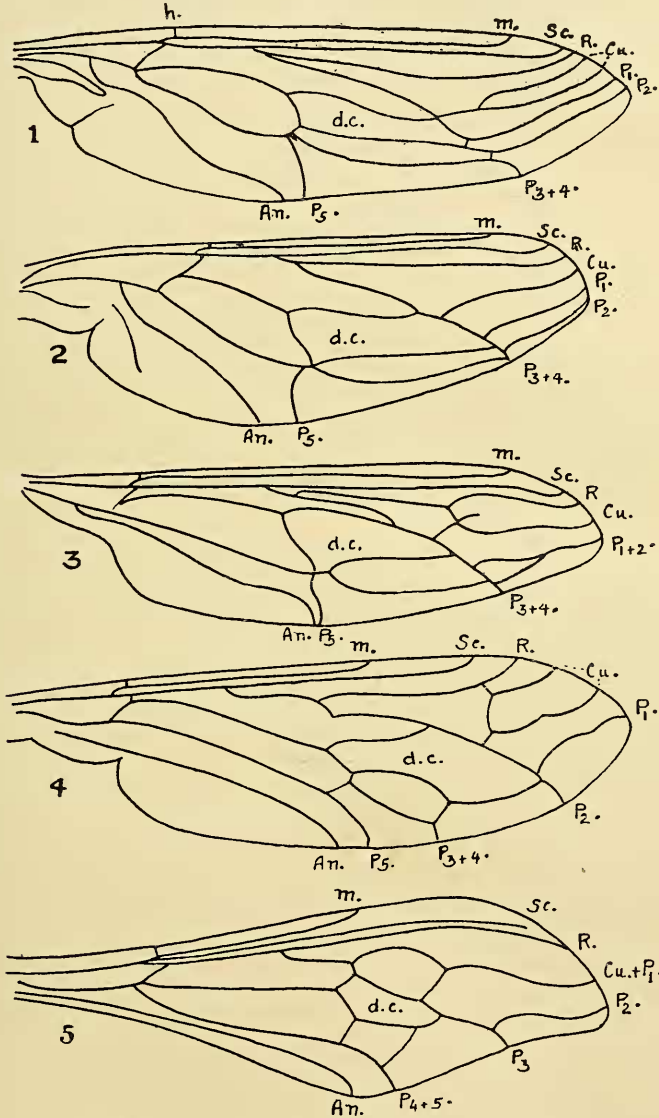
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3. Upper branch of the cubital vein complete and joined at nearly half its length with the radial vein by a cross-vein *Exeretoneura*
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 Cubital and fourth postical veins free, or at most the latter meets the third postical at the wing margin *Atriatops*

Genus TRICHOPTHALMA Westwood. (Figs. 1, 6 and 7.)

Westwood, Lond. Edin. Phil. Mag., vi., 1835, 448; Lichtwardt, Deut. Ent. Zeit., 1910, 371; White, Proc. Roy. Soc. Tasmania, 1914, 65.

Characters.—Proboscis long, well developed. Antennae with three segments



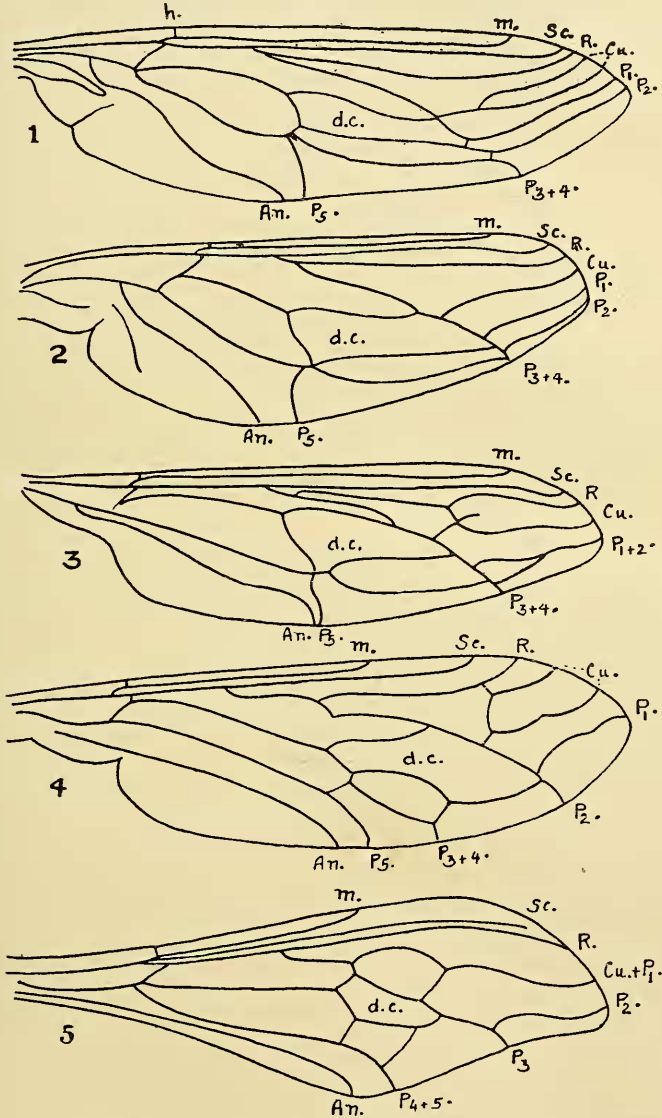
Figs. 1-5. Diagram of the wing venation.

1. *Trichophthalma*; 2. *Atriatops*; 3. *Trichopsidea*; 4. *Exeretoneura*; 5. *Nycterimorpha*. *h.* humeral vein; *m.* mediastinal vein; *Sc.* subcostal; *R.* radial; *Cu.* cubital; *P*₁ first postical vein (second and subsequent postical veins are denoted by suitable figures, *P*₂, etc. and when two of these run together they are denoted as *P*₄₊₅, etc.); *An.* anal vein; *d.c.* discal cell.

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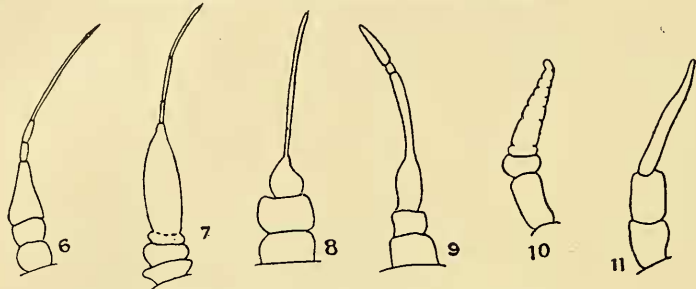
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and a conspicuously jointed arista. Wings with long mediastinal and subcostal veins; radial vein free; the cubital forked; the first and second postical veins reaching the wing margin anterior to the apex; third postical branching from the second and anastomosing with the fourth. The complex diagonal vein is composed of the extreme base of the radial, the basal half of the cubital, the



Figs. 6-11. Diagram of the antennae.

6, 7. The two forms of the antennae found in genus *Trichophthalma*; 8. *Atriatops*; 9. *Trichopsidea*; 10. *Exeretoneura*; 11. *Nycterimorpha*.

vein at the apex of the discal cell, the base of the second postical, the whole of the third and the tip of the fourth posticals. The fourth and fifth posticals rise close together at the apex of the second basal cell.

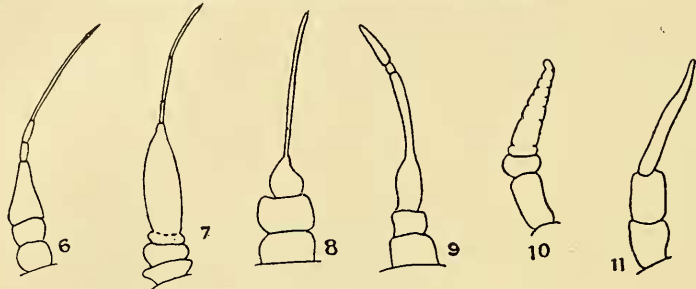
Type, *T. costalis* Westwood. Australia.

Key to the species of the genus Trichophthalma.

1. Third segment of the antennae short and conical, simple 2
Third segment of the antennae longer, with a constricted base that appears like another segment in the antennae 5
2. Abdomen without stripes, at most with a median line of spots 3
Abdomen with distinctly one median and a pair of lateral stripes which are usually not interrupted 4
3. A brown species, invariably with a median line of abdominal spots
. *punctata* Macq.
A brown species with very conspicuous long white pubescence at base of the abdomen *costalis* Westw.
A large uniformly brown species, without pubescence of a contrasting colour *novae-hollandiae* Macq.
A large slate-grey species with yellow pubescence at sides of the thorax and fringing the scutellum *nigripes* Macq.
4. A species with brown or brownish abdomen *fulva* Walk.
A grey species with three broad black or brown stripes on thorax as well as on the abdomen *degener* Walk.
5. Abdomen grey with three black longitudinal stripes and at least a little red pubescence *rosea* Macq.
Abdomen grey with three black longitudinal stripes and also with narrow black bands at segmentations, thus dividing the grey area into spots. *albimacula* Walk.
Abdomen with two or three narrow bands of golden pubescence situated at the apex of the segments *laetilinea* Walk.
Abdomen grey, with at least two narrow black bands on abdomen and without longitudinal stripes *primitiva* Walk.

Note.—As far as yet ascertained, those species that have a superficial resemblance to each other (i.e., not one of affinity), can be separated by means of

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the third antennal segment. In one this is short and conical (see fig. 6), in the other it is not only much longer than broad, but is also constricted near the base, which character gives the antennae the appearance of containing four joints and an arista (see fig. 7). There are no known structural characters, other than those of the antennae, suitable for the determination of the species and on this account the means of identification still depends chiefly upon the outstanding characters of colour and colour-markings. The described forms readily fall into six groups, each of which contains species of allied characters.

Group 1.—*costalis*, *punctata* and *fulvus*.

Group 2.—*novae-hollandiae* and *nigripes*.

Group 3.—*degener*, *heydenii* and probably *leucophaea*.

Group 4.—*rosea*, *bivittata*, *variosa*, *eques* and *albimacula*.

Group 5.—*laetilinea* and probably *richardoae*.

Group 6.—*primitiva*.

The first three groups have a conical third antennal segment; the last three have this segment more elongate and constricted at the base. The third and fourth groups have very similar colour pattern but they differ in shape as well as in the antennae; moreover, the proboscis is often much longer in the former.

Lichtwardt refers to two species for which short descriptions are given but no names. Several further and apparently new species are represented in various collections, but it is not considered expedient to describe these at the present time.

TRICHOPHTHALMA COSTALIS Westwood.

Westwood, Lond. Edin. Phil. Mag., vi., 1835, 448, and Isis, ii., 1838, 86; Lichtwardt, Deut. Ent. Zeit., 1910, 372.—*Rhyncocephalus costalis* Newman, Entom., i., 1841, 220.—? *T. obscura* Westwood, l.c., 1835, 448, and 1838, 86.—*T. albitarsis* Walker, Trans. Ent. Soc. Lond., iv., 1857, 134; Schiner, Reise Novara Dipt., 1868, 112; Lichtwardt, l.c., 1910, 381.—*T. fuscipennis* Thomson, Eugenesia Resa Dipt., 1869, 447; Lichtwardt, l.c., 1910, 385.

Synonymy.—*T. obscura* Westwood was described without a locality, but a specimen in Dr. Ferguson's collection was identified as such by White; unfortunately, this specimen is now in very bad repair (the head and abdomen are missing), but it appears to be identical with some specimens independently identified by me from the description as *T. albitarsis* Walker. I believe *T. costalis* and *T. fuscipennis* also belong here.

Note.—Readily recognised by the soft, white and long pubescence at the base of the abdomen. The indistinct black dorsal stripe of the abdomen, referred to by White in his key, is perceptible on specimens which are inferior in condition; one specimen in Dr. Ferguson's collection has a median line of abdominal spots.

Hab.—New South Wales: Kendall, Leura and Blackheath. From the last-named locality there are five males and one female in my collection taken on the 23rd and 24th November, 1919, all hovering under the same tree. The specimen identified by White as *T. obscura* is from Long Bay, near Sydney, taken on the 17th November, 1913. Como and Wentworth Falls (A. J. Nicholson). Victoria: Oakley, March, 1919 (C. E. Cole), in the National Museum. Queensland: Large specimens from Stradbroke and Bribie Islands, Tambourine Mt. and Brisbane are in the Queensland Museum. Western Australia: A specimen from Hamel in the Queensland Museum.

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TRICHOPHTHALMA ALES Newman.

Rhyncocephalus ales Newman, Entom., i., 1841, 220.—*Trichophthalma ales* Lichtwardt, Deut. Ent. Zeit., 1910, 375.

From the description it is not possible to determine the identity of this species; nevertheless, the name is placed here as it may belong to either *T. costalis* or a closely allied form.

TRICHOPHTHALMA PUNCTATA Macquart.

Hirnoneura punctata Macquart, Dipt. Exot. suppl. 1, 1846, 101.—*Trichophthalma punctata* Lichtwardt, Deut. Ent. Zeit., 1910, 376.—*Hirnoneura nigri-ventris* Macquart, Dipt. Exot. suppl. 4, 1850, 98, Pl. ix., fig. 9.—*Trichophthalma quadricolor* Walker, List Dipt. Brit. Mus., ii., 1849, 234; Lichtwardt, l.c., 380.—*Hirnoneura novae-hollandiae* Macquart, Dipt. Exot. suppl. 4, 1850, 99 (*nec* Macquart, 1840).—*Trichophthalma novae-hollandiae* White, Proc. Roy. Soc. Tasm., 1914, 65 (*nec* Macquart, 1840).

Synonymy.—Under *Trichophthalma novae-hollandiae*, there will be found some remarks indicating a confusion caused by Macquart, who referred two species under one name. One, a male from Tasmania, is undoubtedly the same as a species described under the same specific name by White. As all the above species are attributed to specimens from Tasmania, where only one species belonging to the genus is known, doubtless the synonymy is correct.

Note.—As already pointed out by White, this species is somewhat variable and the colour markings differ in the two sexes; the brownish colour on the male is rather obscure.

Hab.—Apparently restricted to Tasmania, *T. punctata* has a wide distribution over the island and is abundant during the summer months. Twenty-one males and twelve females, also a pair taken *in copula* are in my collection; they are from South Bruni Island, Garden Island, Hobart, Wedge Bay, Dunalley, Mt. Maria and Wynyard; the dates range from December to March. At Strahan, in the west, a specimen was seen by me on two occasions during February, 1924. White referred to the species as occurring on the mainland of Australia, but he was evidently misled by the resemblance to the species now known as *T. fulva*.

TRICHOPHTHALMA FULVA Walker.

Walker, List Dipt. Brit. Mus., ii., 1849, 235; Lichtwardt, Deut. Ent. Zeit., 1910, 380.—*T. ochropa* Thompson, Eugenie Resa Dipt., 1869, 477; Lichtwardt, l.c., 384.

Synonymy.—White, who has evidently examined Walker's type, has identified a specimen in Dr. Ferguson's collection as being this species. I believe Thompson's name refers to the same. A dark greyish-brown female in the National Museum is identified by Miss Ricardo as "probably *Tr. quadricolor* Walker."

Note.—The male is readily distinguishable from the Tasmanian *T. punctata* by the decidedly red-brown abdomen. The black median abdominal stripe is about half the width of the brown stripes on each side of it. In both sexes the narrow black lateral stripes as well as the median stripe may be interrupted to form spots.

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Note.—As already pointed out by White, this species is somewhat variable and the colour markings differ in the two sexes; the brownish colour on the male is rather obscure.

Hab.—Apparently restricted to Tasmania, *T. punctata* has a wide distribution over the island and is abundant during the summer months. Twenty-one males and twelve females, also a pair taken *in copula* are in my collection; they are from South Bruni Island, Garden Island, Hobart, Wedge Bay, Dunalley, Mt. Maria and Wynyard; the dates range from December to March. At Strahan, in the west, a specimen was seen by me on two occasions during February, 1924. White referred to the species as occurring on the mainland of Australia, but he was evidently misled by the resemblance to the species now known as *T. fulva*.

TRICHOPHTHALMA FULVA Walker.

Walker, List Dipt. Brit. Mus., ii., 1849, 235; Lichtwardt, Deut. Ent. Zeit., 1910, 380.—*T. ochropa* Thompson, Eugenie Resa Dipt., 1869, 477; Lichtwardt, l.c., 384.

Synonymy.—White, who has evidently examined Walker's type, has identified a specimen in Dr. Ferguson's collection as being this species. I believe Thompson's name refers to the same. A dark greyish-brown female in the National Museum is identified by Miss Ricardo as "probably *Tr. quadricolor* Walker."

Note.—The male is readily distinguishable from the Tasmanian *T. punctata* by the decidedly red-brown abdomen. The black median abdominal stripe is about half the width of the brown stripes on each side of it. In both sexes the narrow black lateral stripes as well as the median stripe may be interrupted to form spots.

Hab.—Western Australia (Walker), New South Wales, Victoria and Queensland.

TRICHOPTHALMA NOVAE-HOLLANDIAE Macquart.

Hirmonoura novae-hollandiae Macquart, Dipt. Exot., ii., 1840, 19, Pl. ii., fig. 7; also ? suppl. i., 1846, 101 (*nec* suppl. 4, 1850).—*Trichophthalma novae-hollandiae* Schiner, Reise Novara Dipt., 1868, 110; Lichtwardt, Deut. Ent. Zeit., 1910, 373 (*nec* White, 1917).—*T. funesta* Walker, List Dipt. Brit. Mus., ii., 1849, 231; Lichtwardt, *ibid.*, 377.—*Rhyncophalus gigas* Newman, Entom., i., 1841, 220.—*Trichophthalma gigas* Lichtwardt, *ibid.*, 375.

Synonymy.—There is a considerable amount of confusion with regard to this species, which appears to have been described by Macquart from the same form, named later *T. funesta* by Walker. In 1846 Macquart described a smaller specimen, without locality, recording it as a male, the original being a female, and in 1850 he duplicated this action, describing the male from Tasmania. It is certain that neither of the males belong to the same species as the female, and the Tasmanian male is referable to *T. punctata*. From the description I believe *Rhyncophalus gigas* Newman is this species.

Note.—This is a large species of uniform reddish-brown colour.

Hab.—Victoria, New South Wales, Queensland, Stradbroke Island, Torres Straits and Western Australia; December and January. This species is represented in most collections, and a female in mine is from Barrington Tops, December, 1921.

TRICHOPTHALMA NIGRIPES Macquart.

Hirmonoura nigripes Macquart, Dipt. Exot., ii., 1840, 20.—*Trichophthalma nigripes* Lichtwardt, Deut. Ent. Zeit., 1910, 374.—*T. scapularis* Bigot, Ann. Soc. Ent. France (6), i., 1881, 18.

Synonymy.—Macquart's species was described without a locality, but Lichtwardt records it from Australia and adds Bigot's name as a synonym.

Note.—A species resembling *T. novae-hollandiae* but of a slate-like colour and containing yellow hair at the sides of the thorax and base of the abdomen.

Hab.—New South Wales: Eccleston, Kendall, 1 ♂, 3 ♀ in Dr. Ferguson's collection. Queensland: Bribie Island, November, 1918, Stradbroke Island, December, 1913, 1 ♂ and 2 ♀ with colour intermediate between the typical form of this species and *T. novae-hollandiae*.

TRICHOPTHALMA DEGENER Walker.

Trichophthalma degener Walker, List Dipt. Brit. Mus., ii., 1849, 233; Lichtwardt, Deut. Ent. Zeit., 1910, 379.

Note.—This species belongs to a group that has a superficial resemblance to the *T. rosea* series, but it can be readily distinguished by the conical third antennal joint, and usually the proboscis is longer. On the thorax there are three very broad brown or black stripes that occupy nearly the whole surface; the intermediate grey stripes are very narrow and not interrupted. The scutellum and abdomen are brown or black, the latter has a pair of very narrow grey stripes. The eyes are separated in both sexes.

Hab.—Western Australia: Perth, 9th November, 1912, a pair taken *in copula*; also a male in Dr. Ferguson's collection.

TRICHOPTHALMA HEYDENII Jaennicke.

Hirmonoura heydenii Jaennicke, Abh. Senek. Nat. Ges., vi., 1867, 336, Pl. xliii., fig. 7.

TRICHOPHTHALMA NOVAE-HOLLANDIAE Macquart.

Hirmonoura novae-hollandiae Macquart, Dipt. Exot., ii., 1840, 19, Pl. ii., fig. 7; also ? suppl. i., 1846, 101 (*nec* suppl. 4, 1850).—*Trichophthalma novae-hollandiae* Schiner, Reise Novara Dipt., 1868, 110; Lichtwardt, Deut. Ent. Zeit., 1910, 373 (*nec* White, 1917).—*T. funesta* Walker, List Dipt. Brit. Mus., ii., 1849, 231; Lichtwardt, *ibid.*, 377.—*Rhyncophalus gigas* Newman, Entom., i., 1841, 220.—*Trichophthalma gigas* Lichtwardt, *ibid.*, 375.

Synonymy.—There is a considerable amount of confusion with regard to this species, which appears to have been described by Macquart from the same form, named later *T. funesta* by Walker. In 1846 Macquart described a smaller specimen, without locality, recording it as a male, the original being a female, and in 1850 he duplicated this action, describing the male from Tasmania. It is certain that neither of the males belong to the same species as the female, and the Tasmanian male is referable to *T. punctata*. From the description I believe *Rhyncophalus gigas* Newman is this species.

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Synonymy.—Macquart's species was described without a locality, but Lichtwardt records it from Australia and adds Bigot's name as a synonym.

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Hab.—New South Wales: Eccleston, Kendall, 1 ♂, 3 ♀ in Dr. Ferguson's collection. Queensland: Bribie Island, November, 1918, Stradbroke Island, December, 1913, 1 ♂ and 2 ♀ with colour intermediate between the typical form of this species and *T. novae-hollandiae*.

TRICHOPHTHALMA DEGENER Walker.

Trichophthalma degener Walker, List Dipt. Brit. Mus., ii., 1849, 233; Lichtwardt, Deut. Ent. Zeit., 1910, 379.

Note.—This species belongs to a group that has a superficial resemblance to the *T. rosea* series, but it can be readily distinguished by the conical third antennal joint, and usually the proboscis is longer. On the thorax there are three very broad brown or black stripes that occupy nearly the whole surface; the intermediate grey stripes are very narrow and not interrupted. The scutellum and abdomen are brown or black, the latter has a pair of very narrow grey stripes. The eyes are separated in both sexes.

Hab.—Western Australia: Perth, 9th November, 1912, a pair taken *in copula*; also a male in Dr. Ferguson's collection.

TRICHOPHTHALMA HEYDENII Jaennicke.

Hirmonoura heydenii Jaennicke, Abh. Senek. Nat. Ges., vi., 1867, 336, Pl. xliii., fig. 7.

Note.—Very similar to *T. degener*, but the outer thoracic stripes are interrupted.

Hab.—Western Australia; two specimens in the Australian Museum apparently belong to this species and are labelled "K.G.S." (King George Sound).

TRICHOPTHALMA LEUCOPHAEA Walker.

Trichophthalma leucophaea Walker, List Dipt. Brit. Mus., ii, 1849, 233; Lichtwardt, Deut. Ent. Zeit., 1910, 379.

Note.—Distinguished from the two previous species by having the brown thoracic stripes considerably narrower.

Hab.—Western Australia; three faded specimens in the National Museum.

TRICHOPTHALMA ROSEA Macquart.

Hirnoneura rosea Macquart, Dipt. Exot., suppl. 1, 1846, 100.—*Trichophthalma rosea* Lichtwardt, Deut. Ent. Zeit., 1910, 376.—*T. aurora* Walker, List Dipt. Brit. Mus., ii, 1849, 232; Lichtwardt, *ibid*, 381.—*T. montanea* Schiner, Reise Novara Dipt., 1868, 110.—? *T. bivitta* Walker, Trans. Ent. Soc. Lond., 1857, 135; Lichtwardt, *ibid*, 381.

Synonymy.—*H. rosea* Macquart, *T. aurora* Walker and *T. montanea* Schiner undoubtedly refer to one species, which is readily distinguished from its allies by red or rosy pubescence that is invariably abundant on the male and occurs to a limited extent on the female. A male specimen was identified by White as *T. bivitta* Walker, but it is uncertain whether this identification can be correct, as the occurrence of red pubescence is omitted from the description of that species. The figure in Froggatt's "Australian Insects" named *T. eques* appears to represent this species.

Note.—This is one of a series of closely allied forms that are apparently quite distinct species; it occurs abundantly at La Perouse, Botany Bay, and is the commonest Nemestrinid around Sydney; it has not been seen from elsewhere. Moreover, none of the other species of the series has been seen from this locality.

Hab.—New South Wales: Sydney, La Perouse; a series of eighteen males and four females were taken by me during the months of August and September in 1919 and 1920; the species occurs on the wing for four or five weeks only. Specimens are in various collections.

TRICHOPTHALMA BIVITTATA Westwood.

Westwood, Phil. Mag. Lond. and Edinb., vi., 1835, 448; Isis, ii, 1838, 86; Lichtwardt, Deut. Ent. Zeit., 1910, 371.

Note.—From the description this species appears to belong to the *T. rosea* series, but I am not able to place it with certainty. According to Lichtwardt the type is in inferior condition and he suggests that it is the same as *T. bivittata* Thomson; I do not think this suggestion can be correct as Westwood states the thorax is cinereous and on Thompson's species the grey is restricted to two lines. Possibly it was described from a specimen very close to *T. rosea* Macquart but differing in little more than the absence of red pubescence.

TRICHOPTHALMA VARIOLOSA Lichtwardt.

Lichtwardt, Deut. Ent. Zeit., 1910, 386.

Note.—Very similar to *T. degener*, but the outer thoracic stripes are interrupted.

Hab.—Western Australia; two specimens in the Australian Museum apparently belong to this species and are labelled "K.G.S." (King George Sound).

TRICHOPTHALMA LEUCOPHAEA Walker.

Trichophthalma leucophaea Walker, List Dipt. Brit. Mus., ii, 1849, 233; Lichtwardt, Deut. Ent. Zeit., 1910, 379.

Note.—Distinguished from the two previous species by having the brown thoracic stripes considerably narrower.

Hab.—Western Australia; three faded specimens in the National Museum.

TRICHOPTHALMA ROSEA Macquart.

Hirnoneura rosea Macquart, Dipt. Exot., suppl. 1, 1846, 100.—*Trichophthalma rosea* Lichtwardt, Deut. Ent. Zeit., 1910, 376.—*T. aurora* Walker, List Dipt. Brit. Mus., ii, 1849, 232; Lichtwardt, *ibid*, 381.—*T. montanea* Schiner, Reise Novara Dipt., 1868, 110.—? *T. bivitta* Walker, Trans. Ent. Soc. Lond., 1857, 135; Lichtwardt, *ibid*, 381.

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TRICHOPTHALMA VARIOLOSA Lichtwardt.

Lichtwardt, Deut. Ent. Zeit., 1910, 386.

Note.—A specimen in the South Australian Museum, Adelaide, has been tentatively identified by me as this species, but it is not available for study at the time of writing this paper. This species is closely allied to *T. rosea* Macquart.

TRICHOPHTHALMA EQUES Schiner.

Schiner, Reise Novara Dipt., 1868, 110.

Note.—A species closely allied to *T. rosea* Macquart, from which it differs apparently only in the markings of the thorax and the absence of red pubescence. A single female specimen in Dr. Ferguson's collection conforms most closely to Schiner's description, and a series of eight specimens in the Queensland Museum from Brisbane (November) probably belongs to the same form. These contain on the thorax a median black stripe, a pair of lateral stripes interrupted by the transverse suture and extending to only half the length of the thorax, and on the extreme lateral border, lying along the post-alar callus, there is another pair of black stripes. Dr. Ferguson's specimen is from North Queensland, but Schiner's was described from Sydney.

TRICHOPHTHALMA ALBIMACULA Walker.

Walker, List Dipt. Brit. Mus., ii., 1894, 234; Lichtwardt, Deut. Ent. Zeit., 1910, 380.—*T. bivittata* Thomson (*nec* Westwood), Eugenie Resa Dipt., 1869, 476; Lichtwardt, *ibid.*, 382.

Synonymy.—Judging from the original description and White's notes on the type, it seems probable that Walker and Thompson described the same species, Walker's specimen being of an unusually small size.

Note.—A male in my collection and a female in Dr. Ferguson's, apparently belong to this species which differs from *T. rosea* by having the light portions of the thorax limited to two narrow stripes which converge slightly towards the scutellum; the abdomen has narrow bands at the segmentations thus dividing the lighter portions into large, more or less rectangular spots; there is no red pubescence.

Hab.—New South Wales: Murrumbidgee, August, 1921, female; Waterfall, September, 1914, a male taken by Dr. R. J. Tillyard.

TRICHOPHTHALMA LAETILINEA Walker.

Walker, Trans. Ent. Soc. Lond., iv., 1857, 134; Lichtwardt, Deut. Ent. Zeit., 1910, 381.

Note.—A handsome black species with a pair of median grey stripes which converge and are confluent towards the scutellum; also with a converging pair of light lateral fringes composed of long pubescence. The abdomen has a narrow transverse band of yellow pubescence at the apex of three segments. In Dr. Ferguson's collection there is a pair of very small specimens that differ in minor details from the larger ones.

Hab.—New South Wales: Waterfall, a female taken by Dr. R. J. Tillyard, 15th September, 1914. Further specimens are from Blue Mountains and Sydney. Victoria: Mallee Scrub, Western District, 1884, and Narracan, November, 1896 (W. Kershaw), 1 ♂, 2 ♀.

TRICHOPHTHALMA RICHARDOAE Lichtwardt.

Lichtwardt, Deut. Ent. Zeit., 1910, 385.

Note.—This species, described from Adelaide, is unknown to me.

Note.—A specimen in the South Australian Museum, Adelaide, has been tentatively identified by me as this species, but it is not available for study at the time of writing this paper. This species is closely allied to *T. rosea* Macquart.

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Schiner, Reise Novara Dipt., 1868, 110.

Note.—A species closely allied to *T. rosea* Macquart, from which it differs apparently only in the markings of the thorax and the absence of red pubescence. A single female specimen in Dr. Ferguson's collection conforms most closely to Schiner's description, and a series of eight specimens in the Queensland Museum from Brisbane (November) probably belongs to the same form. These contain on the thorax a median black stripe, a pair of lateral stripes interrupted by the transverse suture and extending to only half the length of the thorax, and on the extreme lateral border, lying along the post-alar callus, there is another pair of black stripes. Dr. Ferguson's specimen is from North Queensland, but Schiner's was described from Sydney.

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TRICHOPHTHALMA RICHARDOAE Lichtwardt.

Lichtwardt, Deut. Ent. Zeit., 1910, 385.

Note.—This species, described from Adelaide, is unknown to me.

TRICHOPHTHALMA PRIMITIVA Walker.

Walker, Trans. Ent. Soc. Lond., iv., 1857, 134; Lichtwardt, Deut. Ent. Zeit., 1910, 381.—*T. tabanina* Thomson, Eugenes Resa Dipt., 1869, 476; Lichtwardt, *ibid.*, 384.

Synonymy.—This synonymy is probably correct; Walker's description is traceable to a species well known to me and Thomson's description conforms rather well to the same.

Note.—A small grey species with rather obscure brownish elongate spots on the thorax arranged like interrupted stripes; there are, however, more spots than would be indicated by Thompson's description. The abdomen has two definite transverse bands of black pubescence and a third more or less obscure one.

Hab.—New South Wales: La Perouse, two males taken respectively on the 17th August, 1919, and 21st August, 1920, in association with *T. rosea*, visiting the early spring flowering shrubs; Woy Woy, 8 ♂, 3 ♀ (Nicholson collection).

Genus ATRIATOPS Wandolleck. (Figs. 2, 8.)

Colax Wiedeman, *Analecta Entom.*, 1824, 18, Pl. i., fig. 8; also *Auss. Zweifl. Ins.*, ii., 1830, 260, Pl. ix., fig. 11 (Name preoccupied by Hubner, 1816, and Curtis, 1827).—*Atriatops* Wandolleck, *Entom. Nachrichten*, xxiii., 1897, 245; Lichtwardt, *Deut. Ent. Zeit.*, 1910, 649.

Characters.—The mouth parts are vestigial, or at least very small. Antennae very small, three-jointed and with a long arista. Wings with long mediastinal and subcostal veins, radial vein free, the cubital not forked, the two first postical veins terminate at the apex of the wing, the third and fourth posticals terminate together at the wing margin. The complex diagonal vein is composed of the base of the radial, a considerable length of the cubital which is fused for a short distance with the vein bordering the discal cell, the vein at the apex of the discal cell, the base of the second, the whole of the third and the extreme apex of the fourth postical veins. The fourth and fifth postical veins rise from the second basal cell. This venation differs from that of the genus *Trichophthalma* chiefly in the cubital vein not being forked.

Type, *C. javana* Wiedemann. Java.

ATRIATOPS JAVANA Wiedemann.

Colax javana Wiedemann, *Anal. Entom.*, 1824, 18, Pl. i., fig. 8; also *Auss. Zweifl. Ins.*, ii., 1830, 26, Pl. ix., fig. 11.—*Atriatops javana* Wandolleck, *Entom. Nachrichten*, xxiii., 1897, 246, fig. 1; Lichtwardt, *Deut. Ent. Zeit.*, 1909, 649.

Note.—Lichtwardt records this species from Cape York, Townsville and Palmerston; there are specimens undoubtedly belonging to this genus from various parts of Queensland in several collections and these are attributed to this species. They agree better with the illustration by Westwood (Walker, *Ins. Saund. Dipt.*, Pl. v., fig. 4) for which the name *A. westwoodi* was proposed by Lichtwardt who, however, based his description upon a New Guinea specimen. Until further material and information are available it cannot be ascertained if the specimens referred here are *A. javana*, *A. westwoodi* or yet a third species; they are dated November.

Genus TRICHOPSIDEA Westwood. (Figs. 3, 9.)

Westwood, *Trans. Ent. Soc. Lond.*, ii., 1839, 151, Pl. xiv., fig. 9; Wandolleck, *Entom. Nachrichten*, xxiii., 1879, 250, fig. 6.

TRICHOPHTHALMA PRIMITIVA Walker.

Walker, Trans. Ent. Soc. Lond., iv, 1857, 134; Lichtwardt, Deut. Ent. Zeit., 1910, 381.—*T. tabanina* Thomson, Eugenes Resa Dipt., 1869, 476; Lichtwardt, *ibid.*, 384.

Synonymy.—This synonymy is probably correct; Walker's description is traceable to a species well known to me and Thomson's description conforms rather well to the same.

Note.—A small grey species with rather obscure brownish elongate spots on the thorax arranged like interrupted stripes; there are, however, more spots than would be indicated by Thompson's description. The abdomen has two definite transverse bands of black pubescence and a third more or less obscure one.

Hab.—New South Wales: La Perouse, two males taken respectively on the 17th August, 1919, and 21st August, 1920, in association with *T. rosea*, visiting the early spring flowering shrubs; Woy Woy, 8 ♂, 3 ♀ (Nicholson collection).

Genus ATRIATOPS Wandolleck. (Figs. 2, 8.)

Colax Wiedeman, *Analecta Entom.*, 1824, 18, Pl. i., fig. 8; also *Auss. Zweifl. Ins.*, ii., 1830, 260, Pl. ix., fig. 11 (Name preoccupied by Hubner, 1816, and Curtis, 1827).—*Atriatops* Wandolleck, *Entom. Nachrichten*, xxiii., 1897, 245; Lichtwardt, *Deut. Ent. Zeit.*, 1910, 649.

Characters.—The mouth parts are vestigial, or at least very small. Antennae very small, three-jointed and with a long arista. Wings with long mediastinal and subcostal veins, radial vein free, the cubital not forked, the two first postical veins terminate at the apex of the wing, the third and fourth posticals terminate together at the wing margin. The complex diagonal vein is composed of the base of the radial, a considerable length of the cubital which is fused for a short distance with the vein bordering the discal cell, the vein at the apex of the discal cell, the base of the second, the whole of the third and the extreme apex of the fourth postical veins. The fourth and fifth postical veins rise from the second basal cell. This venation differs from that of the genus *Trichophthalma* chiefly in the cubital vein not being forked.

Type, *C. javana* Wiedemann. Java.

ATRIATOPS JAVANA Wiedemann.

Colax javana Wiedemann, *Anal. Entom.*, 1824, 18, Pl. i., fig. 8; also *Auss. Zweifl. Ins.*, ii., 1830, 26, Pl. ix., fig. 11.—*Atriatops javana* Wandolleck, *Entom. Nachrichten*, xxiii., 1897, 246, fig. 1; Lichtwardt, *Deut. Ent. Zeit.*, 1909, 649.

Note.—Lichtwardt records this species from Cape York, Townsville and Palmerston; there are specimens undoubtedly belonging to this genus from various parts of Queensland in several collections and these are attributed to this species. They agree better with the illustration by Westwood (Walker, *Ins. Saund. Dipt.*, Pl. v., fig. 4) for which the name *A. westwoodi* was proposed by Lichtwardt who, however, based his description upon a New Guinea specimen. Until further material and information are available it cannot be ascertained if the specimens referred here are *A. javana*, *A. westwoodi* or yet a third species; they are dated November.

Genus TRICHOPSIDEA Westwood. (Figs. 3, 9.)

Westwood, *Trans. Ent. Soc. Lond.*, ii., 1839, 151, Pl. xiv., fig. 9; Wandolleck, *Entom. Nachrichten*, xxiii., 1879, 250, fig. 6.

Characters.—The mouth parts contain a very short proboscis which scarcely protrudes beyond the abundant long hair of the face. The antennae are minute and terminate in a short, apparently jointed style. The wings have long mediastinal and subcostal veins; the radial vein is joined to or near the base of the vestigial (sometimes obsolete) upper branch of the cubital fork by a cross-vein; the first and second postical veins anastomose apically for a considerable distance and terminate at about the apex of the wing; the third postical vein joins the apex of the fourth; the complex diagonal vein is composed of the base of the radial and cubital veins (the latter is partly coincident with a portion of the vein bordering the discal cell), the base of the first and second, the whole of the third and apex of the fourth postical veins; the fourth postical vein rises from the discal cell; the fifth postical and anal veins are approximate at the margin of the wing. The four outstanding features of this venation consist of the cross-vein between the radial and cubital veins, the closed second posterior cell, the fourth postical vein rising from the discal cell, and the almost closed anal cell.

Type, *T. oestracea* Westwood. Australia.

TRICHOPSIDEA OESTRACEA Westwood.

Westwood, Trans. Ent. Soc. Lond., ii., 1835, 152, Pl. xiv., fig. 9; Macquart, Dipt. Exot. suppl. 1, 1846, 107; Walker, List Dipt. Brit. Mus., ii., 1849, 235; Wandolleck, Ent. Nachrichten, xxiii., 1897, 250, fig. 6; Lichtwardt, Deut. Ent. Zeit., 1909, 647; and 1910, 387; White, Proc. Roy. Soc. Tas., 1916, 260; Lichtwardt, Ann. Mus. Nat. Hung., xvii., 1919, 277.

Hab.—Queensland: Toowoomba; 15.3.21, 2 females (collected by Barnard), and another without a label, in the Queensland Museum; Victoria: Bunyip, 2 females; Western Australia, 3 females in the National Museum. Macquart, Walker and White give Tasmania as a locality, from which State White says there are specimens in the British Museum.

Genus EXERETONEURA Macquart. (Figs. 4, 10.)

Macquart, Dipt. Exot. suppl. 1, 1846, 105; White, Proc. Roy. Soc. Tas., 1914, 63, text-fig. 8.

Characters.—Mouth parts short and with a thickened extremity, in which they differ from all other genera of the family. Antennae with the third joint composed of several compact segments and without the differentiated style or arista that is in other genera. Wings with a venation consisting of the mediastinal and subcostal veins, which do not reach so far towards the apex as in the other genera; the radial vein joined to about the middle of the upper branch of the cubital by a cross-vein; the first postical vein runs to about the apex of the wing; the second postical forms the apex of the complex diagonal vein which also consists of the base of the radial and cubital veins (the latter being coincident with a portion of the vein bordering the discal cell) and the vein at the apex of the discal cell. The third and fourth postical veins anastomose before reaching the wing-border. The third postical vein rises from the discal cell and the fourth from the second basal cell. The fifth postical is free.

Many of the above characters are considered to be of a primitive nature; the most conspicuous being the composition of the diagonal vein which ends in the second postical vein. The veins that reach the wing-border anterior to the apex are more widely distributed than in the preceding genera. Moreover, the

Characters.—The mouth parts contain a very short proboscis which scarcely protrudes beyond the abundant long hair of the face. The antennae are minute and terminate in a short, apparently jointed style. The wings have long mediastinal and subcostal veins; the radial vein is joined to or near the base of the vestigial (sometimes obsolete) upper branch of the cubital fork by a cross-vein; the first and second postical veins anastomose apically for a considerable distance and terminate at about the apex of the wing; the third postical vein joins the apex of the fourth; the complex diagonal vein is composed of the base of the radial and cubital veins (the latter is partly coincident with a portion of the vein bordering the discal cell), the base of the first and second, the whole of the third and apex of the fourth postical veins; the fourth postical vein rises from the discal cell; the fifth postical and anal veins are approximate at the margin of the wing. The four outstanding features of this venation consist of the cross-vein between the radial and cubital veins, the closed second posterior cell, the fourth postical vein rising from the discal cell, and the almost closed anal cell.

Type, *T. oestracea* Westwood. Australia.

TRICHOPSIDEA OESTRACEA Westwood.

Westwood, Trans. Ent. Soc. Lond., ii., 1835, 152, Pl. xiv., fig. 9; Macquart, Dipt. Exot. suppl. 1, 1846, 107; Walker, List Dipt. Brit. Mus., ii., 1849, 235; Wandolleck, Ent. Nachrichten, xxiii., 1897, 250, fig. 6; Lichtwardt, Deut. Ent. Zeit., 1909, 647; and 1910, 387; White, Proc. Roy. Soc. Tas., 1916, 260; Lichtwardt, Ann. Mus. Nat. Hung., xvii., 1919, 277.

Hab.—Queensland: Toowoomba; 15.3.21, 2 females (collected by Barnard), and another without a label, in the Queensland Museum; Victoria: Bunyip, 2 females; Western Australia, 3 females in the National Museum. Macquart, Walker and White give Tasmania as a locality, from which State White says there are specimens in the British Museum.

Genus EXERETONEURA Macquart. (Figs. 4, 10.)

Macquart, Dipt. Exot. suppl. 1, 1846, 105; White, Proc. Roy. Soc. Tas., 1914, 63, text-fig. 8.

Characters.—Mouth parts short and with a thickened extremity, in which they differ from all other genera of the family. Antennae with the third joint composed of several compact segments and without the differentiated style or arista that is in other genera. Wings with a venation consisting of the mediastinal and subcostal veins, which do not reach so far towards the apex as in the other genera; the radial vein joined to about the middle of the upper branch of the cubital by a cross-vein; the first postical vein runs to about the apex of the wing; the second postical forms the apex of the complex diagonal vein which also consists of the base of the radial and cubital veins (the latter being coincident with a portion of the vein bordering the discal cell) and the vein at the apex of the discal cell. The third and fourth postical veins anastomose before reaching the wing-border. The third postical vein rises from the discal cell and the fourth from the second basal cell. The fifth postical is free.

Many of the above characters are considered to be of a primitive nature; the most conspicuous being the composition of the diagonal vein which ends in the second postical vein. The veins that reach the wing-border anterior to the apex are more widely distributed than in the preceding genera. Moreover, the

antennae and proboscis are generalized in structure, a statement that may also be applied to the abdomen, which is longer than that in the other genera, and is more or less parallel-sided.

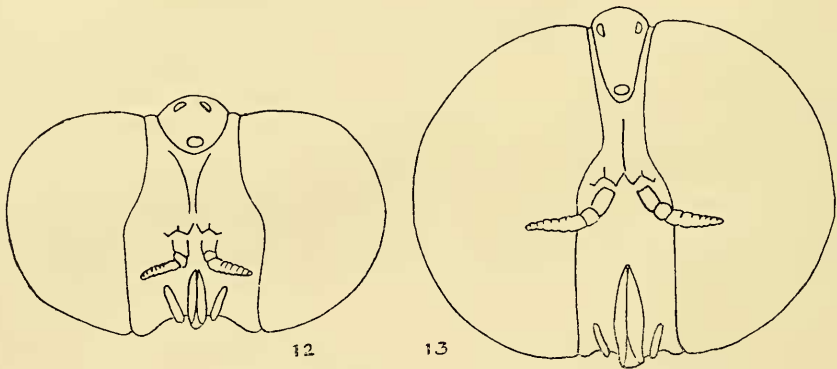
Type, *E. maculipennis* Macquart. Tasmania.

EXERETONEURA MACULIPENNIS Macquart. (Fig. 12.)

Macquart, Dipt. Exot. suppl. 1, 1846, 106, Pl. ix., fig. 6; Lichtwardt, Deut. Ent. Zeit., 1909, 651; White, Proc. Roy. Soc. Tas., 1914, 63, fig. 8.

Note.—Distinguishable from *E. angustifrons*, n.sp., by the width of the head between the eyes; the front near the antennae is about as wide as long.

Hab.—Tasmania: Bellerive, 3 ♂ taken by sweeping in long grass on the sand-dunes at Bellerive beach on the 14th March, 1917; 1 ♂, 1 ♀ from the same locality in the National Museum (C. E. Cole); Cradle Mt., Pencil Pine Creek, 1 ♂, 17th January, 1917. New South Wales: Mt. Kosciusko, February and March, 1920, 1 ♂ and 3 ♀ in Dr. Ferguson's collection; other specimens have also been taken on this Mountain; Barrington Tops, 1 ♂, 1 ♀ (A. J. Nicholson).



Figs. 12-13. Diagram of the heads in the genus *Exeretoneura*. 12. *E. maculipennis* Macquart; 13. *E. angustifrons*, n.sp.

EXERETONEURA ANGUSTIFRONS, n.sp. (Fig. 13.)

Differs from *E. maculipennis* Macquart by having a very narrow front, which, near the antennae, does not exceed half its length. Head black, two tufts of yellow hairs above the antennae and the hair on the face also yellowish. Thorax blackish-brown and with three black median stripes; the majority of the hairs are yellowish. Scutellum brownish-black. Abdomen black, which colour merges into yellowish-brown at the apex on the female only; pubescence yellowish and white; venter yellow-brown. Legs and veins of the wing yellowish. Male considerably more pubescent than the female, and its front narrower. Length: ♂. 15 mm.; ♀. 19 mm.

Hab.—Victoria: Gisborne, holotype ♂ and allotype ♀, a pair taken *in copula*, by Mr. G. Lyell, 11.3.1917; Gippsland, 1 ♂, 1 ♀, paratypes in the National Museum. New South Wales: 1 ♂ paratype from Ebor, taken by Dr. A. J. Turner, 8.1.1914, in the Queensland Museum.

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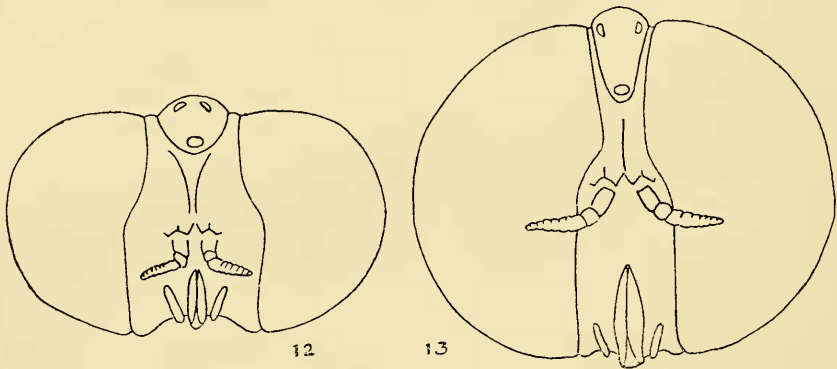
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NYCTERIMORPHA Lichtwardt. (Figs. 5, 11.)

Lichtwardt, Deut. Ent. Zeit., 1909, 648, fig. 6.

Characters.—Proboscis not apparent, palpi conspicuous. Antennae with two equally short basal segments and a slender long third segment which is apparently but very obscurely segmented. Wings with the mediastinal vein reaching to about the middle of the costa; subcostal vein not quite reaching the wing margin; radial vein free, but branching from the subcostal near the humeral cross-vein; cubital vein not forked and apically anastomosing with the first postical vein thus closing the first posterior cell. The second postical vein reaches the margin just before the apex of the wing and the third postical branches from the second. The complex diagonal vein is composed of the base of the cubital vein, the median transverse vein, part of the vein bordering the discal cell, the base of the second and the whole of the third postical veins. The fourth postical rising from the discal cell runs into the fifth.

Type, *N. speiseri* Lichtwardt. Queensland.

NYCTERIMORPHA SPEISERI Lichtwardt.

Lichtwardt, Deut. Ent. Zeit., 1909, 648, fig. 6.

Hab.—Queensland: Cairns (Lichtwardt); Tambourine Mt. (W. H. Davidson) in the Queensland Museum. This is a single specimen that was originally preserved in spirit.

Genus NYCTERIMYIA Lichtwardt.

Lichtwardt, Deut. Ent. Zeit., 1909, 648.

Nycterimyia has been recorded from Queensland and is apparently not represented in any Australian collection; it should be readily recognised by the presence of a cross-vein between the subcostal and radial, in addition to the one between the radial and cubital veins. The cubital vein is simple, not branched, the first postical apparently is absent and the fourth joins the third to form the apex of the complex diagonal vein. These characters are deduced from Lichtwardt's figure.

Type, *Trichopsidea dohrni* Wandolleek. Sumatra.

NYCTERIMYIA HORNI Lichtwardt.

Lichtwardt, Ent. Mitt., i, 1912, 27, fig. 1.

Hab.—Queensland: Kuranda (Lichtwardt).

List of Works.

- BIGOT, 1881.—*Ann. Soc. ent. France*, series 6, Vol. i.
 JAENNICKE, 1867.—*Abh. Senck. Naturf. Ges.*, vi.
 LICHTWARDT, 1909-10.—*Deut. entom. Zeitsch.*, 1909-1910.
 ————, 1912.—*Entom. Mitt.*, i.
 ————, 1919.—*Ann. Mus. Nat. Hungarici*, xvii.
 MACQUART, 1838-54.—*Diptera Exotique nouveau ou peu connus*. (Republished from *Mém. Soc. roy. Sci. de l'Agric. et Arts, Lille.*)
 NEWMAN, 1841.—*The Entomologist*, i.
 SCHINER, 1868.—*Reise der Oesterreichischen Fregatte Novara um die Erde, etc., Zoologischer Theil*, ii., Diptera.
 THOMSON, 1869.—*K. Sven. Fregattem Eugenie's Resa omkring jorden*. Diptera.

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- WALKER, 1849.—List of the Dipterous insects in the British Museum. Diptera,
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———, 1857.—*Trans. Ent. Soc. Lond.*, iv.
WANDOLLECK, 1897.—*Entomologische Nachrichten*, xxiii.
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WIEDEMANN, 1824.—*Analecta entomologica ex museo regio Havniensi maximo
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